Syllabus

Phil 305/505: Mathematical Logic
Fall 2014
version 1.0

Professor:

Richard Grandy
rgrandy@rice.edu (email), x2720 (direct phone), x4994 (secretary)
Office Hours: MWF 1:30–2:30 and by appointment (Humanities 203)

Teaching Assistant:

Joshua Reagan
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Review Sessions: 12:00–12:50 every Friday (Humanities 227)
Test Review Sessions: xxxx-xxxx before exams (Humanities 227)

Course Time and Location:

MWF: 10:00am–10:50am
Location: TBD

Course Goals:

Students should develop an understanding of formal languages and related concepts, including logical truth, entailment and derivations. They should also develop an understanding of metalinguistic concepts such as soundness, completeness and the method of recursive proof. They should develop an appreciation of both the value and limits of formal languages for analyzing reasoning and natural languages.

Course Objectives:

Students will demonstrate on examinations the abilities to: evaluate metatheoretical statements and provide proofs or counterexamples, to construct derivations in GQD, translate English sentences into GQL, to give examples of sentences which are difficult to translate and explain why.

Grading:

- There will be **five** take-home **examinations** during the semester which will count 20% each.
- The **Final** is a comprehensive **optional** take-home and will count a third if you choose to take it.

- All homework is **optional** and mostly is not graded, but it is very strongly recommended that you do appropriate amounts. There will be **ten graded assignments** worth 10 points each. If your cumulative grade on those assignments is greater than your lowest exam score, we will substitute the graded homework score for that exam.

Honor Code:

- All forms of assistance are permitted on ungraded homework. Collaborative studying is encouraged.
- Notes and the text are permitted to be consulted on graded homework, but not other forms of assistance.
- No assistance of any kind is permitted on examinations—no notes, friends, internet, etc. If you have questions during an examination, please email both me and the TA.

Required Texts and Materials:

All material for the course is available free in Owlspace. The pdfs for course textbook are in the Resources folder.

Lateness Policy:

Graded homeworks and exams are due at the beginning of the next class. Late homeworks and exams will be penalized per hour.

Absence Policy:

Attendance is not required, but students are responsible for all material covered in lecture.

Disability Policy:

Any student with a documented disability needing academic adjustments or accommodations is requested to speak with me during the first two weeks of class. All discussions will remain confidential. Students with disabilities should also contact Disability Support Services, Rm. 111 Allen Center, 713-348-5841, www.dss.rice.edu.

Note:

The specific assignments, due dates, etc may be changed if necessary due to circumstances beyond the control of the instructor. (Hurricanes happen.)

Course Schedule:

Wk	Lr	Day	Date	Topic	Note
1	1	m	Aug 25	Introduction	
	2	w	Aug 27	Syntax of GSL	
	3	f	Aug 29	Truth, Interpretations and Logical Truth	Review Session at 12pm
2		m	Sep 01	no class	Labor Day
		t	Sep 02		Graded HW 1 due at 12pm
	4	w	Sep 03	Entailment	
	5	f	Sep 05	Recursive Proof	Review Session at 12pm
3	6	m	Sep 08	Equivalence, Contraries and Contradictories	Graded HW 2 due
	7	w	Sep 10	More Entailment and Recursive Proof	
	8	f	Sep 12	Disjunctive Normal Form	Review Session at 12pm
4	9	m	Sep 15	Syntax of GQL	Exam 1 due
	10	w	Sep 17	Syntax for GQL/ Semantics for GQL	
	11	f	Sep 19	Semantics for GQL	Review Session at 12pm
5	12	m	Sep 22	Formal Semantics for GQL	Graded HW 3 due
	13	w	Sep 24	Quantificational Truth	
	14	f	Sep 26	Contraries	Review Session at 12pm
6	15	m	Sep 29	Begin Translations	Graded HW 4 due
	16	w	Oct 01	Translations	
	17	f	Oct 03	More Translations	Review Session at 12pm

Course Schedule (Cont'd):

Wk	Lr	Day	Date	Topic	Note
7	18	m	Oct 06	Dragnet Theorem and Applications	Exam 2 due
	19	w	Oct 08	More Truth, Entailment, etc	
	20	f	Oct 10	GSD Derivations	Review Session at 12pm
8		m	Oct 13	no class	Midterm Recess
	21	w	Oct 15	GSD Derivations/ GSD^+ Derivations	Graded HW 5 due
	22	f	Oct 17	GSD^+ Derivations/ GQD Derivations	Review Session at 12pm
9	23	m	Oct 20	More Derivations	Graded HW 6 due
	24	w	Oct 22	Still More Derivations	
	25	f	Oct 24	Even More Derivations (than before)	Review Session at 12pm
10	26	m	Oct 27	Soundness of GSD	Exam 3 due
	27	w	Oct 29	Completeness of GSD	
	28	f	Oct 31	Many Valued Logics	Review Session at 12pm
11	29	m	Nov 03	Soundness of GQD, Replacement Theorem, Soundness of GS/QD^+, and Prenex Normal Form	Graded HW 7 due
	30	w	Nov 05	Completeness Method	
	31	f	Nov 07	Completeness Models	Review Session at 12pm
12	32	m	Nov 10	More Completeness	Graded HW 8 due
	33	w	Nov 12	Löwenheim-Skolem Theorem and Decision Methods	
	34	f	Nov 14	Review of the Method, etc	Review Session at 12pm

Course Schedule (Cont'd):

Wk	Lr	Day	Date	Topic	Note
13	35	m	Nov 17	Syntax and Semantics of Modal Logic	Exam 4 due
	36	w	Nov 19	Modal Derivations	
	37	f	Nov 21	Syntax of GQLI, Truth and Translations	Review Session at 12pm
14	38	m	Nov 24	GQDI Derivations	Graded HW 9 due
	39	w	Nov 26	Review of Modality and Idenity	
		f	Nov 28	no class	Thanksgiving
15	40	m	Dec 01	Course Review and Glimpses Beyond	Graded HW 10 due
	41	w	Dec 03		Exam 5 due
	42	f	Dec 05	Exam 5 Returned and Preview of Optional Final	